

Applied Excel for Business and Marketing

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Just as meteorologists can predict the path of a hurricane by its current path, you can use forecasting to spot trends in the data and make an educated guess as to where that data is headed.

1.2. How to Create a Time Series [10]

You would create a time series in pretty much the same way that you would enter data for any purpose in Excel. What makes a time series different than other data series is that the values correspond to different points in time.

For example, suppose you wanted to track the number of students in a particular class from semester to semester over a number of years. Then you would create a time series for enrollment.

1.3. FORECAST.ETS function[1]

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Calculates or predicts a future value based on existing (historical) values by using the AAA version of the Exponential Smoothing (ETS) algorithm. The predicted value is a continuation of the historical values in the specified target date, which should be a continuation of the timeline. You can use this function to predict future sales, inventory requirements, or consumer trends.

This function requires the timeline to be organized with a constant step between the different points. For example, that

ABSTRACT

Applied Excel is powerful to analyze business and marketing data. This paper intends to support business and marketing leaders the benefits of data forecasting with applied Excel. It showed the sale data forecasting for coming seasons. As Excel's background methods, it showed time series methods such as the FORECAST.ETS And FORECAST.ETS.SEASONALITY methods. And then Sample data 'forecast functions.xlsx' was downloaded from Google and was analyzed and viewed. It used Microsoft Excel software version 2016.

KEYWORDS: *Applied Excel, Time Series Methods Such As the Forecast.Ets and Forecast.Ets. Seasonality Methods*

1. INTRODUCTION

Nowadays, businesses are competing with others not to lose their market places in local and external regions. To avoid the loss of market places they should use data science technology. This paper used Microsoft Excel's time series methods. It showed the sale data forecasting for coming seasons that includes three tables, the result of each table, one graph and data analytical view.

1.1. Understanding Time Series Forecasting in Excel[10]

What is time series forecasting, and how does Excel make this task easy to do?

Time series forecasting is all about using existing data to make predictions about future events.

could be a monthly timeline with values on the 1st of every month, a yearly timeline, or a timeline of numerical indices. For this type of timeline, it's very useful to aggregate raw detailed data before you apply the forecast, which produces more accurate forecast results as well.

FORECAST.ETS(target_date, values, timeline, [seasonality], [data_completion], [aggregation])

1.4. FORECAST.ETS.SEASONALITY function[2]

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Returns the length of the repetitive pattern Excel detects for the specified time series. FORECAST.ETS. Seasonality can be used following FORECAST.ETS to identify which automatic seasonality was detected and used in FORECAST.ETS. While it can also be used independently of FORECAST.ETS, the functions are tied since the seasonality detected in this function is identical to the one used by FORECAST.ETS, considering the same input parameters that affect data completion.

FORECAST. ETS. SEASONALITY (values, time line [data _ completion], [aggregation])

2. Methods

FORECAST.ETS function [1]

Syntax

FORECAST.ETS (target_date, values, timeline, [seasonality], [data_completion], [aggregation])

The FORECAST.ETS function syntax has the following arguments:

- **Target_date** Required. The data point for which you want to predict a value. Target date can be date/time or numeric. If the target date is chronologically before the end of the historical timeline, FORECAST.ETS returns the #NUM! error.
- **Values** Required. Values are the historical values, for which you want to forecast the next points.
- **Timeline** Required. The independent array or range of numeric data. The dates in the timeline must have a consistent step between them and can't be zero. The timeline isn't required to be sorted, as FORECAST.ETS will sort it implicitly for calculations. If a constant step can't be identified in the provided timeline, Forecast.ETS will return the #NUM! error. If timeline contains duplicate values, FORECAST.ETS will return the #VALUE! error. If the ranges of the timeline and values aren't of same size, FORECAST.ETS will return the #N/A error.
- **Seasonality** Optional. A numeric value. The default value of 1 means Excel detects seasonality automatically for the forecast and uses positive, whole numbers for the length of the seasonal pattern. 0 indicates no seasonality, meaning the prediction will be linear. Positive whole numbers will indicate to the algorithm to use patterns of this length as the seasonality. For any other value, FORECAST.ETS will return the #NUM! error. Maximum supported seasonality is 8,760 (number of hours in a year). Any seasonality above that number will result in the #NUM! error.
- **Data completion** Optional. Although the timeline requires a constant step between data points, FORECAST.ETS supports up to 30% missing data, and will automatically adjust for it. 0 will indicate the algorithm to account for missing points as zeros. The default value of 1 will account for missing points by completing them to be the average of the neighboring points.
- **Aggregation** Optional. Although the timeline requires a constant step between data points, FORECAST.ETS will aggregate multiple points which have the same time stamp. The aggregation parameter is a numeric value indicating which method will be used to aggregate several values with the same time stamp. The default value of 0 will use AVERAGE, while other options are SUM, COUNT, COUNTA, MIN, MAX, MEDIAN.

FORECAST.ETS.SEASONALITY function[2]

Syntax

FORECAST.ETS . SEASONALITY (values , time line , [data _ completion] , [aggregation])

The FORECAST.ETS.SEASONALITY function syntax has the following arguments:

- **Values** Required. Values are the historical values, for which you want to forecast the next points.

- **Timeline** Required. The independent array or range of numeric data. The dates in the timeline must have a consistent step between them and can't be zero. The timeline isn't required to be sorted, as FORECAST.ETS.SEASONALITY will sort it implicitly for calculations. If a constant step can't be identified in the provided timeline, FORECAST.ETS.SEASONALITY will return the #NUM! error. If timeline contains duplicate values, FORECAST.ETS.SEASONALITY will return the #VALUE! error. If the ranges of the timeline and values aren't of same size, FORECAST.ETS.SEASONALITY will return the #N/A error.
- **Data completion** Optional. Although the timeline requires a constant step between data points, FORECAST.ETS.SEASONALITY supports up to 30% missing data, and will automatically adjust for it. 0 will indicate the algorithm to account for missing points as zeros. The default value of 1 will account for missing points by completing them to be the average of the neighboring points.
- **Aggregation** Optional. Although the timeline requires a constant step between data points, FORECAST.ETS.SEASONALITY will aggregate multiple points which have the same time stamp. The aggregation parameter is a numeric value indicating which method will be used to aggregate several values with the same time stamp. The default value of 0 will use AVERAGE, while other options are SUM, COUNT, COUNTA, MIN, MAX, MEDIAN.

Statistic = FORE CAST. ETS. STAT(values, time line , statistic _ type)

Confidence= FORE CAST .ETS .CONFINT (target _date, values, time line)

3. Testing

A. Table-1:Original Data

4	Date	Units sold	Confidence	Upper Bound	Lower Bound
5	Jan-15	800			
6	Feb-15	700			
7	Mar-15	500			
8	Apr-15	600			
9	May-15	800			
10	Jun-15	750			
11	Jul-15	825			
12	Aug-15	775			
13	Sep-15	700			
14	Oct-15	2,100			
15	Nov-15	2,500			
16	Dec-15	3,200			
17	Jan-16	775			
18	Feb-16	725			
19	Mar-16	550			
20	Apr-16	650			
21	May-16	825			
22	Jun-16	825			
23	Jul-16	850			
24	Aug-16	800			
25	Sep-16	775			
26	Oct-16	2,500			
27	Nov-16	3,000			
28	Dec-16	3,500			
29	Jan-17	800			
30	Feb-17	750			
31	Mar-17	625			
32	Apr-17	700			
33	May-17	850			
34	Jun-17	900			
35	Jul-17	950			
36	Aug-17	900			
37	Sep-17	875			
38	Oct-17	2,500			
39	Nov-17	2,500			
40	Dec-17	3,500			
41	Jan-18				
42	Feb-18				
43	Mar-18				
44	Apr-18				
45	May-18				
46	Jun-18				

B. Data Forecasting

FORECAST.ETS(target_date, values, timeline, [seasonality], [data_completion], [aggregation])

Table-2: Result of forecasting

4	Date	Units sold
41	Jan-18	926
42	Feb-18	877
43	Mar-18	700
44	Apr-18	790
45	May-18	971
46	Jun-18	960

C. Calculate Seasonality

FORECAST.ETS.SEASONALITY(values, time line, [data_completion], [aggregation])

Seasonality = 12

D. Calculate Statistics

FORECAST.ETS.STAT(values, timeline, statistic_type)

Statistics = 0.001

E. Calculate Confidence, Upper Bound and Lower Bound

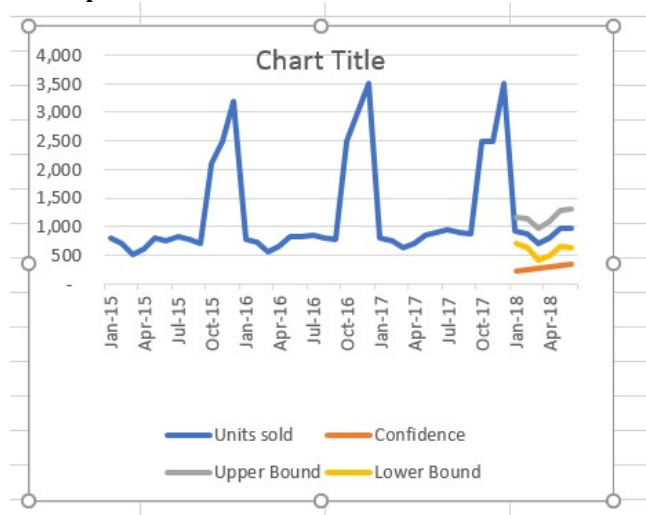
Confidence=FORECAST.ETS.CONFINT(target_date, values, timeline)

Upper Bound= Units Sold+Confidence

Lower Bound=Unit Sold-Confidence

Table-3: Result of Confidence, Upper Bound and Lower Bound

4	Date	Units sold	Confidence	Upper Bound	Lower Bound
41	Jan-18	926	226	1,152	700
42	Feb-18	877	253	1,130	624
43	Mar-18	700	277	978	423
44	Apr-18	790	300	1,090	490
45	May-18	971	321	1,292	650
46	Jun-18	960	341	1,301	619

F. Graph-1: Show actual and forecast data**G. Confidence Interval**

☒ Confidence Interval 95% Timeline Range seasonality/SAS4:SAS46

Seasonality ☒ Detect Automatically ☐ Set Manually 12 Values Range seasonality/SBS4:SBS46

☐ Include forecast statistics Fill Missing Points Using Interpolation

Aggregate Duplicates Using Average

H. Analytical View

-As 3(B), (E) and (F), before sale, business leader can know maximum sale and minimum sale in specific time line. So, he can avoid the shortage of goods and waste of goods.

-As 3(C), (D) and (H), can know that data periods is 12 seasons. And then statistics value is 0.001 less than 0.05 and confidence interval is 95%, so the used-data (original data) is significant. So, this data forecasting is actuated.

4. Conclusion

Excel data analysis tools are valuable in social science, business and marketing fields. It is very good for presentation report by graphical design. Business leaders can get their goal with good forecasting result and can avoid the loss of market places in local and global regions by using applied Excel software.

References

- [1] FORECAST.ETS function - Office Support.html
- [2] FORECAST.ETS.SEASONALITY function Office Support .html
- [3] Office.com/Excel/Community
- [4] Office.com/Excel/What Is New
- [5] Office.com/Excel/Feedback
- [6] Office.com/Excel/Help
- [7] Office.com/Excel/Support
- [8] Office.com/Excel/Training
- [9] Office.com/Excel/Block
- [10] <https://magoosh.com/excel/understanding-time-series-forecasting-in-excel/>